

Cerritos Novice Conference 2020

International Atomic Energy Association (IAEA)



**Topic: Improving Infrastructure for Nuclear
Facilities**

Director: Alexander Sim

October 10th, 2020

To Delegates of CHSMUN Novice 2020

Dear Delegates,
Welcome to CHSMUN Novice 2020!

It is our highest honor and pleasure to welcome you all to our 2020 online novice conference here at Cerritos High School. On behalf of the Cerritos High School Model United Nations program, we are proud to host our very first virtual novice conference, where you will become more knowledgeable on international issues, participate in intellectually stimulating discussions, and create new and everlasting friendships.

The CHSMUN program continues to compete around the world as a nationally ranked MUN program. Our delegates utilize diplomacy in order to create complex solutions towards multilateral issues in the global community. Our head chairs are selected from only the best seniors of our program, undergoing a rigorous training process to ensure the highest quality of moderating and grading of debate. Furthermore, all the topic synopses have been reviewed and edited numerous times. We strongly believe that by providing each and every delegate with the necessary tools and understanding, he or she will have everything they need to thrive in all aspects of the committee. We thoroughly encourage each delegate to engage in all of the facets of their topic, in order to grow in their skills as a delegate and develop a greater knowledge of the world around them.

Although this wasn't what we expected, our advisors and staff have put in countless hours to ensure delegates have an amazing experience at the online conference. Our greatest hope is that from attending CHSMUN 2020, students are encouraged to continue on in Model United Nations and nevertheless, inspired to spark change in their surrounding communities. CHSMUN Novice 2020 will provide a quality experience for beginner delegates to develop their speaking and delegating skills.

If you have any questions, comments, or concerns, please contact us! We look forward to seeing you at CHSMUN Novice 2020!

Sincerely,

Anjali Mani and Karishma Patel

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Secretary-Generals

A Note From The Director

Delegates,

My name is Alex Sim and it is my deepest pleasure to be serving as your Director for the International Atomic Energy Agency (IAEA) Committee. This is my 4th year in the MUN program here at Cerritos and without a doubt, I can say that being a part of this program has truly been a life-changing experience. From traveling to New York for the Nationals conference to making some of my closest friendships, I truly cherish all my time in this program. On campus, I am involved in the Red Cross Club and the National Honors Society as well being a part of the track and basketball team here at Cerritos. Outside of Model UN, I volunteer at an academy to tutor and aid students with both academics and fun activities. In addition, I have pursued my interest in psychology by interning for a professor at Cal State University of Long Beach where I analyzed models to find how animals' eating patterns correlated to their daily cognitive functions. In my free time, you can catch me watching anime, raging on Valorant, playing basketball, and eating KKBQ with the boys. With all that being said, I look forward to watching you guys all debate and collaborate on these pressing issues. I'm hopeful you guys will be able to grow as delegates while having a good, memorable time. Feel free to email me if you have any questions regarding the committee and the topics. See you guys in committee!

Sincerely,

Alexander Sim

Director, IAEA

Committee Introduction

In response to the boom of nuclear technology in the 1950's, the International Atomic Energy Association (IAEA) was created in 1957. Specifically, the initial idea of the IAEA was proposed by President Eisenhower to the UN General Assembly in December 1953 and following that, the U.S. Ratification of the Statute, ratified on July 29, 1957, had marked the beginning of the IAEA. Created as an entity independent from national governments, the IAEA serves as a global forum for nuclear cooperation, nuclear safety standards, nuclear application, and many more. Since its founding, the IAEA has made huge strides to guarantee the peaceful and secure use of nuclear energy, power, and more. For example, as a direct response to preventing nuclear accidents such as Fukushima and Chernobyl where thousands of lives were lost due to the mishandling of nuclear power, the IAEA International Emergency Preparedness and Response (EPR) framework was created in order to strengthen effective emergency response measures to nuclear emergencies on both a national and international level. As a part of the IAEA EPR framework, the IAEA Incident and Emergency System also came into fruition, which focuses on assisting member states to efficiently prepare for nuclear accidents and developing safety standards for nuclear energy use. To this day, the IAEA consists of 171 member states and has played a key role in the signing and ratification of around 50 nuclear treaties by the member states of the United Nations.

TOPIC: Improving Infrastructure for Nuclear Facilities

Background:

Known for its reliability and efficiency, nuclear power has become a pivotal contributor to the world's functions. In response to the increased usage of this resource, the need for infrastructures regulating the development and functioning of nuclear facilities is of utmost importance. When it comes to launching a nuclear power program and maintaining a nuclear facility, the urgency of careful preparation in addition to investments in time, finances, and resources is essential. Specifically, the development of nuclear facilities can range from anywhere of 10-15 years of preparatory work and a commitment of 100 years to maintain it. In order to successfully ensure the security of these nuclear facilities, the implementation of infrastructures must be seen through, especially for lesser developed nations. It is currently estimated that around 30 countries are considering, planning, or potentially starting nuclear power programs in addition 20 more countries that are taking in consideration beginning construction for nuclear facilities. However, these lesser developed nations lack the proper resources when it comes to nuclear facilities whether it be starting up one or maintaining one. For instance, when starting up a nuclear facility, the facility must be properly designed and have its design licensed. However, emerging countries generally do not have the expertise to do this and therefore, rely on more developed countries such as the UK or United States for design licensing. While the developed countries take care of the licensing process, the lesser developed countries focus on building stability to license the actual operation of the facility. As defined by the IAEA, a sustainable infrastructure "provides governmental, legal, regulatory, managerial, technological, human resource, industrial, and stakeholder support" in the span of a nuclear facility's life. Components such as the establishment of legal and regulatory frameworks, development of human assets and strategies, and construction of national institutions all play a significant role in ensuring a stable infrastructure for facilities to follow. Within this committee, countries will be focusing their attention to improving the infrastructure of these nuclear facilities, including the development of new ones, in order to ensure the safety of nuclear power taking into consideration that its use will only increase as years pass. By the year 2040, it is estimated that energy consumption will be 50% higher than the current consumption rate. As the need to accommodate these increases grows everyday, the commitment to devising and implementing infrastructures for these nuclear facilities is even greater. Nuclear power may have its benefits but as many know, with great power comes great responsibility. Tragic events such as Fukushima and Chernobyl are instances where flawed design within nuclear facilities contributed to nuclear accidents totaling up to around 20,000 deaths. Chernobyl occurred due to having a flawed reactor design along with inadequately trained personnel to monitor operations within the plant. Even with a flawed reactor design, the situation at Chernobyl could have very well been handled if the facility contained capable and experienced personnel. Similar to this, the Fukushima Daiichi nuclear disaster was as bad as it was because of faulty infrastructure.

Although the Fukushima accident was mainly caused due to an extreme earthquake with a magnitude of 9.0 and a 15 meter tsunami, it is important to take into consideration the reactors at Fukushima were proved to be built robust seismically but extremely vulnerable to tsunamis. Specifically, Fukushima reactors were built to withstand tsunamis up to 5.7 meters high but the tsunami that struck the plant that day was 15 meters high. This means that the overall infrastructure at the facility was weak and because of “holes” like this within the infrastructure, it made these nuclear accidents way worse than they should have been. Had the infrastructure of the Fukushima facility been better built and equipped for tsunamis, it could have possibly lessened the effects and been preventable. Disasters like this have spurred the IAEA into improving nuclear safety measures, specifically through the integration of nuclear infrastructures. A main form of how these infrastructures have guided member states is through frameworks. Frameworks are created and implemented in order to ensure that nuclear energy operations are done both efficiently and safely. They set out guidelines and regulations for member states to follow when utilizing the services of nuclear energy. Currently, the framework of the IAEA calls upon the need to make constant changes in order to accommodate to changes in nuclear law. However, the issue is that some countries participating in nuclear energy operations do not adhere to the guidelines within these frameworks. That is why the need to implement frameworks to monitor and guide these member states is so crucial. One of the IAEA’s most reliable frameworks is its “Nuclear Security Series” which essentially lays out objectives for the IAEA, recommendations for member states, and technical guidance for nuclear security measures. The Nuclear Security Series is the basis of nuclear safety assessment through all departments of the IAEA and even has measures mentioned in it in the event of a nuclear emergency. In addition to frameworks, another issue to address when it comes to improving infrastructure for nuclear facilities is assisting lower developed countries with the process that comes along with nuclear facilities as a whole. As previously stated before, emerging countries in the nuclear facility process lack the proper resources to both build and maintain. These resources can range anywhere from human personnel to technology. In regards to the human resources, one of the main methods that has been utilized to help these countries gain trained, capable personnel is through the United States Nuclear Regulatory Commission’s Power Plant Engineering Course Manual. This is one of the main methods the United States has utilized in order to aid these emerging countries in constructing infrastructure for nuclear facilities. The NRC’s training courses comprises a Power Plant Engineering Course Manual, Site Access Training, Welding Technology & Codes, NRC Reactor Concepts, and many more. Anything that needs to be addressed when building infrastructures for lesser developed countries can be found here. Frameworks like the Nuclear Security Series and aid resources like the Nuclear Regulatory Commission’s Training Courses are pivotal to the development of infrastructures for nuclear facilities and have been effective in ensuring the safe construction of power plants.

United Nations Involvement:

Seen as a potential contributor to sustainable development, nuclear facilities have been recognized by the United Nations as a key component that must be properly handled and assisted. Events during the Second World War, such as Hiroshima and Nagasaki, initially brought attention to nuclear issues and since then, the UN has strived to ensure the proper and secure use of nuclear energy. For instance, the United Nations along with the IAEA have collaborated to provide guidance, advice, and review services to countries desiring to launch nuclear power programmes. Together, they have created the Milestones Approach, which is a comprehensive method that assists a country in understanding the commitments and obligations that come along with developing nuclear power programmes in nuclear facilities. Essentially, the Milestones Approach comprises of three phases that facilitate the development of a national infrastructure for nuclear power. Phase 1 encompasses the basic considerations that need to take place before a decision to launch a nuclear power program is taken. Phase 2 involves the preparatory work needed for contracting and construction of a nuclear facility after the decision has been made. Lastly, Phase 3 is the action that needs to be taken to construct the nuclear power plant. In total, the Milestones Approach includes 19 nuclear infrastructure issues that helps guide countries to work in a systematic way to promote secure nuclear facilities. In addition to these measures taken, the UN has adopted numerous resolutions in the past to assist the IAEA in its efforts to promote secure nuclear power use within member states' facilities. For example, Resolution A/72/221 was adopted to primarily target strengthening international collaboration in the fields of nuclear science, energy, technology, transport, and waste safety. Moreover, the GA/11449 was passed in 2013 in which the GA acknowledged the IAEA's commitment on nuclear safety and further encouraged them to continue their endeavors. Following that, in 2014, the UN passed GA/11578 whose main goals were to increase nuclear safety and maintain the peaceful, secure use of nuclear technologies internationally. The United Nations' relationship with the IAEA is overseen by an agreement signed in 1957 which states, "The Agency undertakes to conduct its activities in accordance with the Purposes and Principles of the United Nations Charter to promote peace and international cooperation, and in conformity with policies of the United Nations furthering the establishment of safeguarded worldwide disarmament and in conformity with any international agreements." However, it is important to note that while bodies residing in the UN and the IAEA do have the power to set standards and guidelines, they do not have powers to enforce them upon member states. On top of UN efforts to promote improving infrastructures within nuclear facilities, non-governmental organizations such as the World Association of Nuclear Operators (WANO) have made strides in assisting member states in maintaining their nuclear facilities. Specifically, WANO offers services such as peer review, performance analysis, member support, and even training and development on a global scale. Post-Fukushima, WANO performs a four-year frequency for peer reviews with a follow-up at the two-year point. Currently, WANO has offices in Atlanta, London, Moscow, Paris, and Tokyo. What sets aside WANO from the rest of the NGO's is that they are recognized by the IAEA and have collaborated with programs within the IAEA, both past and present, on operations pertaining to strengthening infrastructure in facilities. Organizations such as WANO are prime examples of those who positively provide to the cause of improving infrastructure in nuclear

facilities and their continued collaboration with the IAEA has moved mountains in the field of nuclear services.

Bloc Positions:

Western Bloc: For nations residing within the Western bloc, the idea of nuclear power is widely supported, therefore the need for infrastructures is significant. The main leaders of these western nations for nuclear power are the United States, Canada, and Europe. As of last year, the United States was reported to have 96 operating nuclear reactors along with 58 nuclear power plants within 28 states. The United States also accounts for more than 30% of global nuclear energy production. For Canada, it has been a leader in nuclear research and technology and 15% of Canada's electricity stems from its nuclear facilities. Within the European Union, nuclear power plays a significant role as well. Europe depends on nuclear energy for a quarter of its electricity and even higher proportions for its base-load power. Like other western nations, Europe focuses on nuclear energy as the key to a future of reliable energy and power. For the Western Bloc, nuclear power continues to play a key role within nations and the development of secure infrastructures is crucial to these residing nations.

Latin America and the Caribbean Bloc: The nuclear situation within the Latin America and Caribbean bloc is a fragile one. Currently, there are seven nuclear power reactors operating in Latin America - 3 in Argentina, 2 in Brazil, and 2 in Mexico. These countries are the leaders within the bloc when it comes to nuclear power and reactors and have strict regulations when it comes to monitoring these facilities. However, the acquiring, possessing, developing, testing, or use of nuclear weapons is completely prohibited within Latin American states. This was due to the ratification of the Treaty of Tlatelolco. Therefore, countries within this bloc are not associated whatsoever with nuclear weapons at the moment.

African Bloc: For the African bloc, Africa, in regards to continents, is at the bottom of nuclear power with South Africa being the only African country that has nuclear power. Specifically, there are two nuclear reactors in Koeberg, which is near Cape Town, and the infrastructure within these facilities are not the strongest due to the low amount of attention given to nuclear activities itself. These two nuclear reactors produce approximately 5% of the country's electricity. Although many countries within the African bloc have not made use of nuclear power/energy yet, many are considering its use seeing as how nuclear energy's efficiency is extremely efficient and reliable. However, before they do so, many African countries need to properly assess the pros and cons of nuclear energy and take measures to understand the obligations that come with developing infrastructures for nuclear facilities.

Asian-Pacific Bloc: A handful of countries within the Asian-Pacific Bloc are leaders in nuclear power and reactor production. For example, Japan and South Korea are leaders in nuclear power output housing approximately 20 functioning plants each. India is a prime example of a country whose government is committed to growing its nuclear power output as a part of its

infrastructure development program. Electricity generating capacity in addition to nuclear development is the fastest within the continent of Asia and from December 2007 to 2017, the amount of operable reactors in Asia had increased from 106 to 131. Currently, there are 130 operable nuclear reactors in Asia with many more in the works. In order to properly manage these facilities, the IAEA started offering the Integrated Nuclear Infrastructure (INIR) missions in 2009 to help evaluate the status of countries' nuclear infrastructures. In Asia alone, countries such as Indonesia, Malaysia, the Philippines, Thailand, and Vietnam have taken these missions in hopes of improving their nuclear facilities.

Basic Solutions:

In regards to improving infrastructure for nuclear facilities, delegates should focus on solutions that pertain to the establishment of legal and regulatory frameworks for monitoring, devisement of financial strategies and review services for nuclear facilities, and the promotion of increased transparency within the international community when it comes to nuclear facility operations. In order to have a solid framework for nuclear facilities and member states to follow, frameworks should consist of proper regulations, guidelines, and management programs for safety. Take, for example, the Convention on Nuclear Safety. Essentially, this treaty establishes basic fundamental safety regulations for member states that operate land-based nuclear power plants to follow. The parties signed under this treaty are obligated to send mandatory reports on their nuclear energy operations for peer review at meetings at the IAEA headquarters. This, in turn, promotes not only the strengthening of the nuclear facilities' infrastructure but also transparency because participating parties are aware of which parties are practicing safe nuclear energy operations and ensures that no one is fabricating any information. In addition to this, delegates should also consider methods on how to assist countries that are interested in developing nuclear facilities. An example of this is the Integrated Regulatory Review Service (IRRS). This is a service provided by the IAEA to its member states in order to strengthen the infrastructure of nuclear facilities. Adhering to the IAEA Safety Standards, representatives from the IAEA are able to analyze member states' nuclear infrastructures and from there, provide assistance, whether it be through developing tools or methodologies to these parties. IRRS missions conducted by experts and technical advisors from the IAEA have been one of the main ways that the IAEA has been able to promote safe nuclear energy practices among its member states. Similar to the IRRS, is the Integrated Nuclear Infrastructure Review (INIR). This is also a peer review system where upon request by a member state, the IAEA will conduct an INIR mission. This team consists of international experts who are fully knowledgeable within specialized nuclear infrastructure fields. Post-mission, INIR experts have in-depth conversations with IAEA member state representatives which not only promotes the use of review services to improve infrastructures but also transparency between parties.

Questions to Consider:

1. How can countries ensure that other countries follow the nuclear guidelines in frameworks to improve infrastructure?
2. How can countries incentivize countries, who are not open to peer reviews, to allow review services to be performed in their facilities? What will be done in the event a country is not following the suggested infrastructure guidelines?
3. How can more developed and experienced countries assist newer countries in the beginnings of nuclear facility and power development?
4. How much has your country played a role in devising and implementing infrastructures in the international community? Has shown to not support infrastructures?
5. How can countries ensure that proposed measures to improve infrastructures do not fail like previous ones?

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